



Spectral Gamma-Ray Borehole Log Data Report

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Borehole

10-04-08

Log Event A

Borehole Information

Farm : <u>A</u>	Tank : <u>A-104</u>	Site Number : <u>299-E24-67</u>
N-Coord : <u>41,287</u>	W-Coord : <u>47,849</u>	TOC Elevation : <u>689.35</u>
Water Level, ft :	Date Drilled : <u>5/31/1962</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>125</u>	

Borehole Notes:

This borehole was drilled in May 1962 to a depth of 75 ft using 6-in.-diameter casing. In October 1976, the borehole was extended to a depth of 130 ft and completed at 125.3 ft. There is no indication in the driller's log or Chamness and Merz (1993) that the casing was perforated or that the borehole was grouted.

For this report, a 6-in.-diameter casing was used to process the SGLS data. It is assumed the casing thickness is 0.280 in., on the basis of the published thickness for schedule-40, 6-in. pipe, as observed by the logging engineer.

The top of the casing is the zero reference for the SGLS. The casing lip is even with the ground surface.

Equipment Information

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>04/1996</u>	Calibration Reference : <u>GJPO-HAN-5</u>	Logging Procedure : <u>P-GJPO-1783</u>

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>09/27/1996</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>124.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>60.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>
Log Run Number : <u>2</u>	Log Run Date : <u>09/30/1996</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>61.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>0.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



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Logging Operation Notes:

This borehole was logged in two log runs. The total logging depth achieved with the SGLS was 124.5 ft.

Analysis Information

Analyst : R.R. Spatz

Data Processing Reference : MAC-VZCP 1.7.9

Analysis Date : 03/24/1998

Analysis Notes :

The pre- and post-survey field verification spectra for all logging runs met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from these spectra were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging.

A casing correction factor for 0.280-in.-thick casing was applied to the log data during the analysis process.

Shape factor analysis was applied to the SGLS data. Insights are provided into the distribution of radionuclide contaminants.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data. A plot of the shape factor analysis results is also included. The plot is used as an interpretive tool to help determine the radial distribution of man-made contaminants around the borehole.

Results/Interpretations:

The only man-made radionuclide detected in this borehole was Cs-137. Cs-137 contamination was detected continuously from the ground surface to 19 ft and almost continuously from 20 to 30.5 ft. Cs-137 in the interval from 1 to 4 ft ranges in concentration from 1 to 20 pCi/g. The maximum Cs-137 concentration for this borehole was 20 pCi/g at 1.5 ft. The concentrations average about 1 pCi/g in the interval from 4 to 19 ft and range from 0.3 to 5 pCi/g in the interval from 26 to 28 ft. Cs-137 contamination occurs intermittently from 55 to 70.5 ft and 81 to 81.5 ft just above the MDL (0.2 pCi/g).

The plot of the naturally occurring radionuclides shows the K-40 concentrations decrease at about 45 ft from a general background of 14 pCi/g above this depth to about 12 pCi/g between 45 and 55 ft. Below 55 ft, the K-40 concentrations increase to 18 pCi/g. Below 85 ft, the K-40 concentrations decrease slightly to about 14 pCi/g and remain fairly constant to the bottom of the borehole (124.5 ft).



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An analysis of the shape factors associated with applicable segments of the spectra was performed. Comments on the interpretation of the shape factor results are presented in the Tank Summary Data Report for tank A-104.